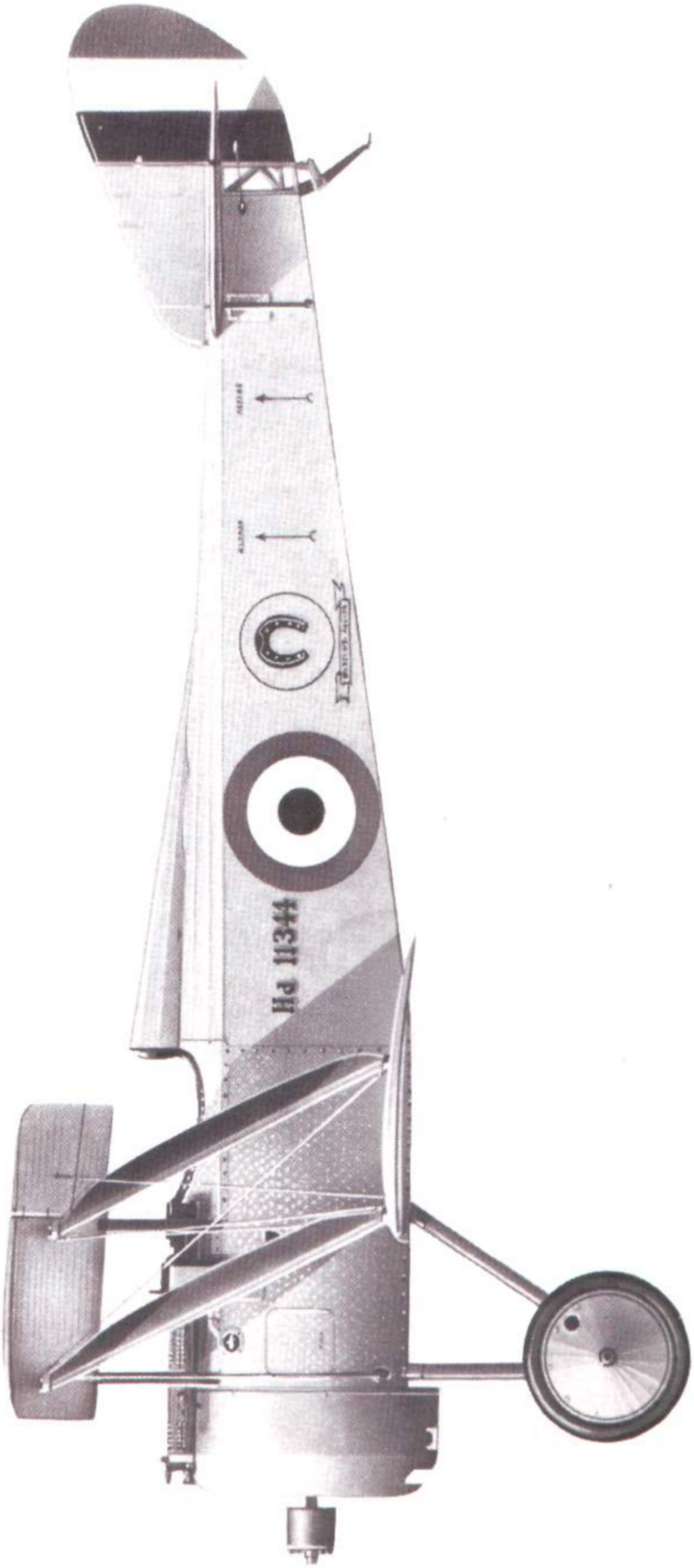
PROFILE
PUBLICATIONS

The
Hanriot
HD 1



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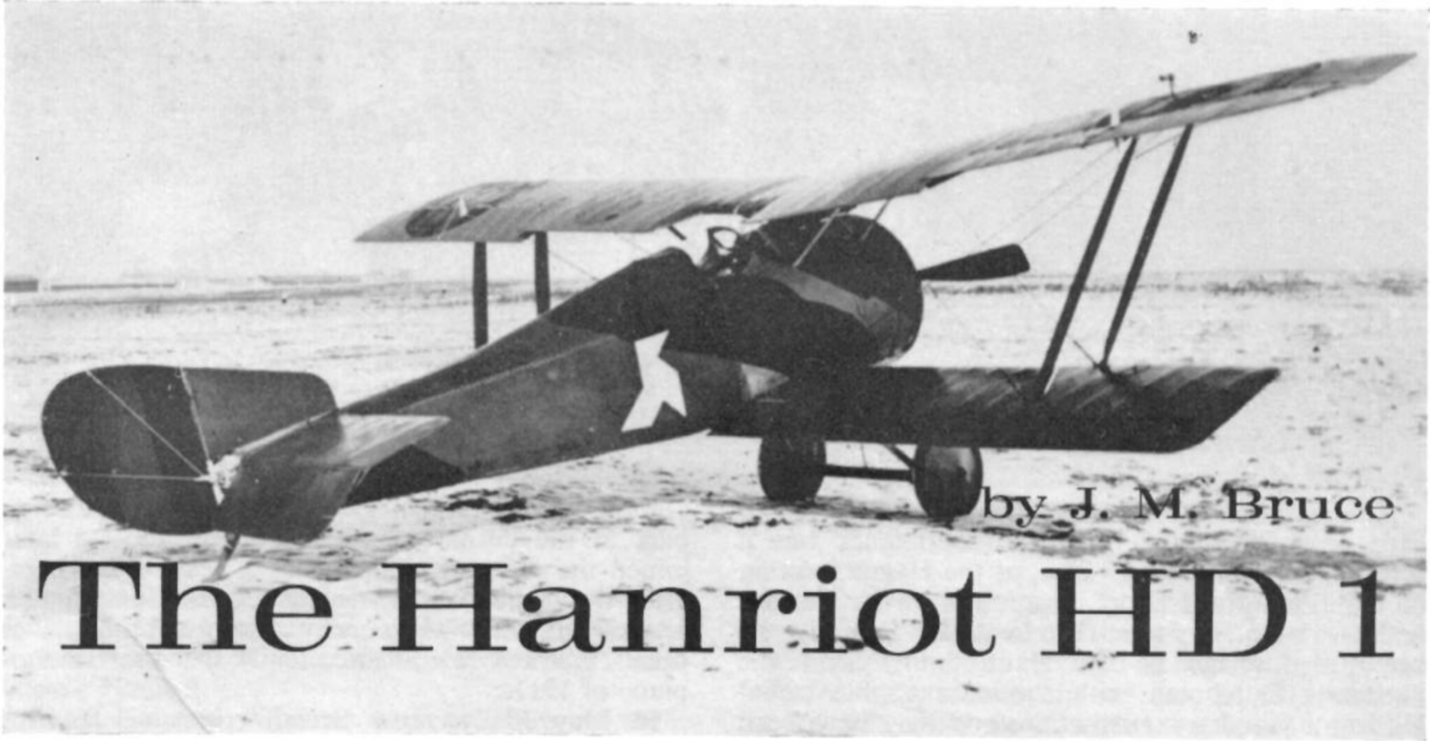
TWO SHILLINGS



by J. M. Bruce

The Hanriot HD 1

Belgian HD-1 bearing the cocotte *marking of the* 11^{me} Escadrille. (Photo: Musée Royal de l'Armée, Brussels)

Although it was built in large quantities, was widely used in two theatres of war, and was a favourite mount of some of the leading fighter pilots of the 1914-18 war, the Hanriot HD-1 is not to be found in any of the contemporary volumes of that respected work of reference, *Jane's All the World's Aircraft*. Indeed, the existence of the wartime Hanriot company was not acknowledged earlier than the 1919 volume, which contained little more than a sketchy reference to the HD-3C.2 two-seater.

The name of Hanriot was well known in the pioneer period of French aviation. In the early years of the century René Hanriot had acquired a reputation as a driver of Darracq cars. His first aircraft was designed at Chalons-sur-Marne in 1907; it was a somewhat exiguous monoplane powered by a 50-h.p. Buchet six-cylinder in-line engine. This was followed by a number of elegant monoplanes characterized by unusually slender fuselages.

The original Hanriot factory was at Reims, and in the spring of 1910 Hanriot set up a flying school three miles away at Béthény, where he was assisted by Louis Wagner, another celebrated Darracq driver of the period. René Hanriot's son Marcel, then aged only fifteen, flew his father's monoplanes regularly and achieved a measure of fame as the world's youngest aviator.

As early as April 1910 a small production batch of the monoplane with 40 h.p. Gyp engine was under construction; this aircraft had a span of 31 ft. 6 in. and wing area of 369 sq. ft. Contemporary with it was the smaller but equally elegant *Libellule*, generally similar in appearance but powered by a 20-h.p. two-cylinder Darracq. Span was only 24 ft. 7 in., the wing area 170 sq. ft.

An interesting feature of early Hanriot development technique was the use of an experimental flying model, powered by a 3-h.p. Dutheil-Chalmers engine. This was used as a means of trying out ideas that were embodied in the full-scale monoplanes.

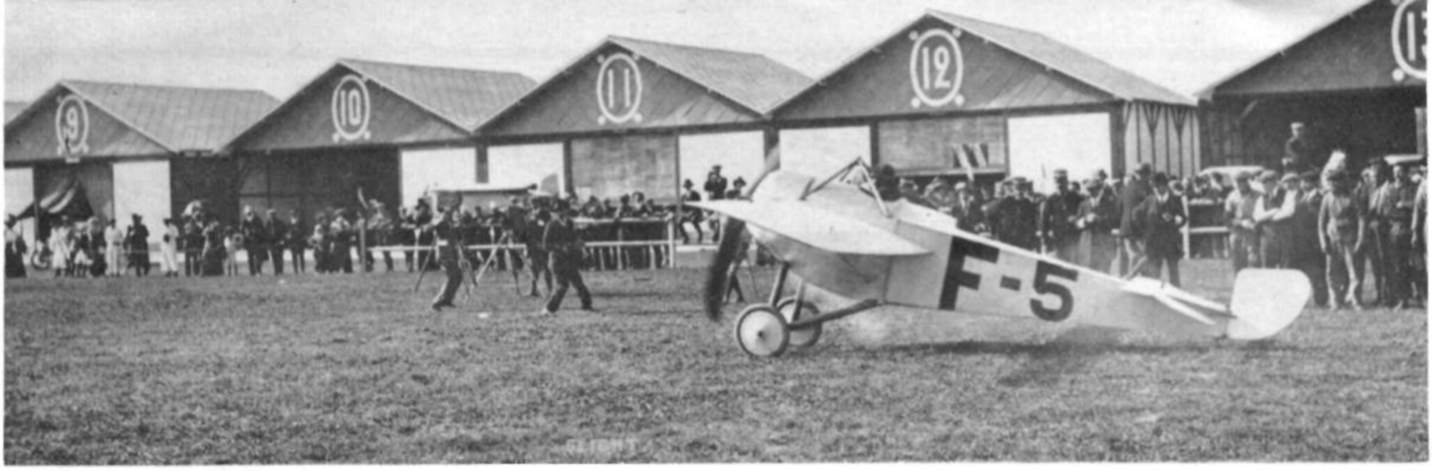
A British company, The Hanriot Monoplane, Ltd., was established in May 1910, with offices at 143-145 Great Portland Street, London, W., to promote the sale of the Hanriot aircraft in Britain. Wagner participated in the Bournemouth flying meeting of July 1910, his mount being one of the graceful Hanriots powered by a 40-h.p. Clerget engine. His aircraft drew these enthusiastic comments from the reporter of *The Aero:*

> "The machine is very beautiful in the air, and seemed splendidly stable . . . . His flying is magnificent, and his machine is a most beautiful object in the air."

That same issue of *The Aero* (July 20th, 1910) contained illustrations of a new French monoplane built by the Nieuport company. Although it lacked the grace and beauty of the Hanriot monoplanes the Nieuport was a neat and sensible design, its only doubtful feature being a curious tail unit. It was one of the first designs with which M. Pagny was associated.

The graceful Hanriot monoplane of 1910 is here exemplified by Mr. A. C. Thomas's aircraft, possibly the only British-owned Hanriot of this type. It had a 35-h.p. E.N.V. engine and was photographed at Brooklands in October 1910, with E. Keith Davis in the cockpit. (Photo: Flight International)

The Pagny-designed Hanriot monoplane (100-h.p. Gnome) flown by Bielovucic in the British Military Trials of August 1912. (Photo: Flight International 0166)



The Ponnier-Pagny Gordon Bennett racing monoplane of 1913, flown by Emile Védrines at a speed of 197.5 km./hr (123.5 m.p.h.) (Photo: via Flight International)

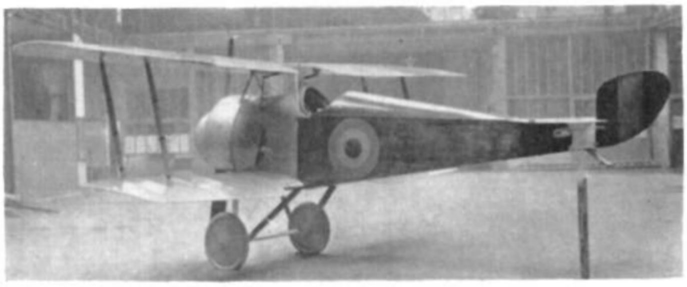
Among those whose careers in aviation included an early association with Hanriot monoplanes was a certain "M. Koolhoven" who, at the Hague meeting of 1910, flew for 3 hours 51 minutes on an Hanriot with a 45-h.p. Grégoire-Gyp engine. Possibly the beautiful fuselage of the Hanriot impressed the ingenious Dutchman with the considerable possibilities of wooden construction, and may have been the early inspiration of his later design activities with the Deperdussin and B.A.T. companies.

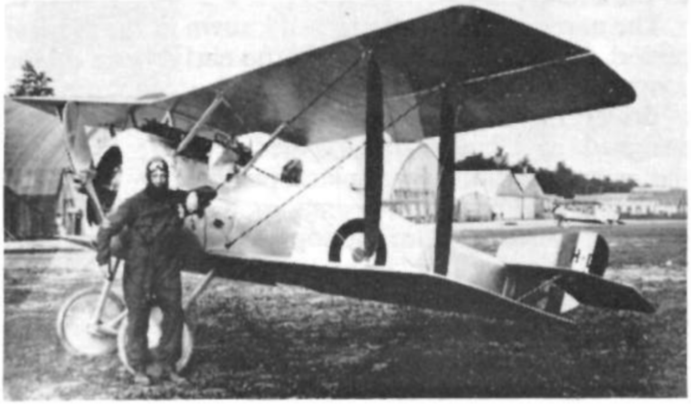
A flying school was started at Brooklands in the spring of 1911 by the Hanriot concern. During the previous year an Hanriot owned by Mr. A. C. Thomas had flown consistently well there in the hands of such pilots as Keith Davis and E. C. Gordon England. The instructor at the Hanriot school was E. V. B. Fisher, who was killed on 13th May 1912 while flying a Flanders monoplane.

In 1911 the French government held a competition for military aircraft. Among the participating aeroplanes were a two-seat Hanriot monoplane with a four-cylinder Clerget engine and an excellent Nieuport monoplane with a 100-h.p. 14-cylinder Gnome rotary. Again Pagny had played a leading part in the design of the Nieuport, and he later joined the Hanriot company as a designer. Thereafter the characteristic elegant Hanriot design was abandoned, and subsequent Hanriot monoplanes bore a marked resemblance to the Nieuport monoplane of 1911.

In May 1912 a new British company, Hanriot (England) Ltd. was set up, with offices at 412 Moorgate Station Chambers, London E.C. During that year three Hanriot monoplanes were built by the British firm of Hewlett & Blondeau Ltd., ostensibly because the Hanriot works were working to capacity.

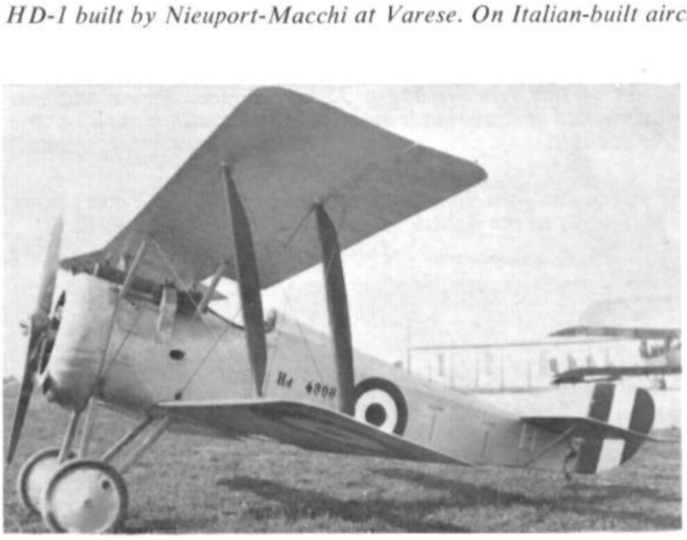
The year 1912 had seen at the British Military Trials the appearance of the excellent Pagny-designed two-seat Hanriot monoplane. Two examples, each powered by a 100-h.p. Gnome engine, were entered by Hanriot (England) Ltd.; one was flown by Sidney Sippé, the other by the Peruvian pilot J. Bielovucic.

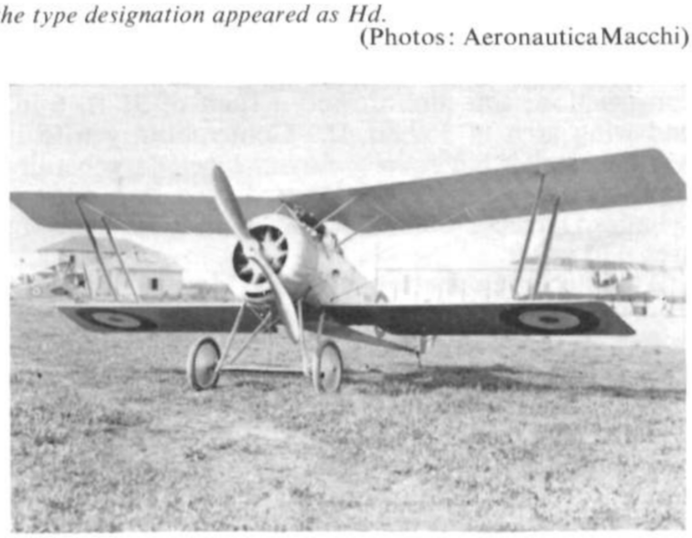


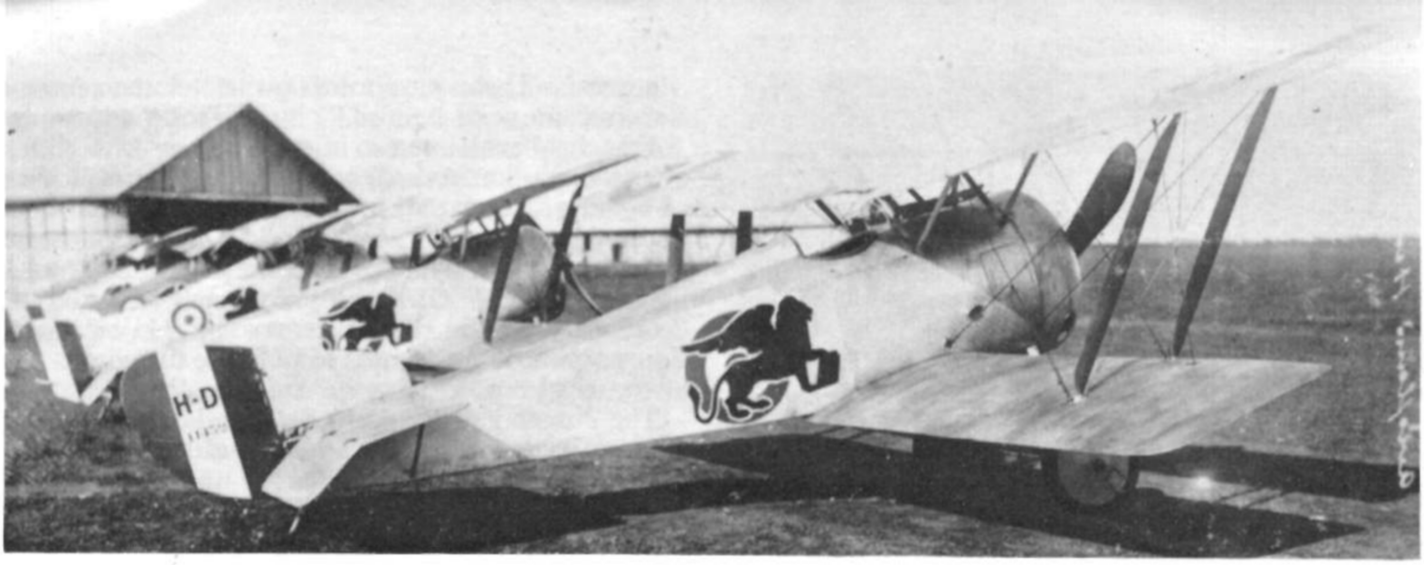


Left: Said to have been designed by Pierre Dupont, the Ponnier M.1 resembled the Ponnier-Pagny Gordon-Bennett racer in several features and especially in the design of its tail unit. Right: Hanriot-built HD-1, apparently photographed in France. (Photo: Jean Nöel)

HD-1 built by Nieuport-Macchi at Varese. On Italian-built aircraft the type designation appeared as Hd.
(Photos: Aeronautica Macchi)







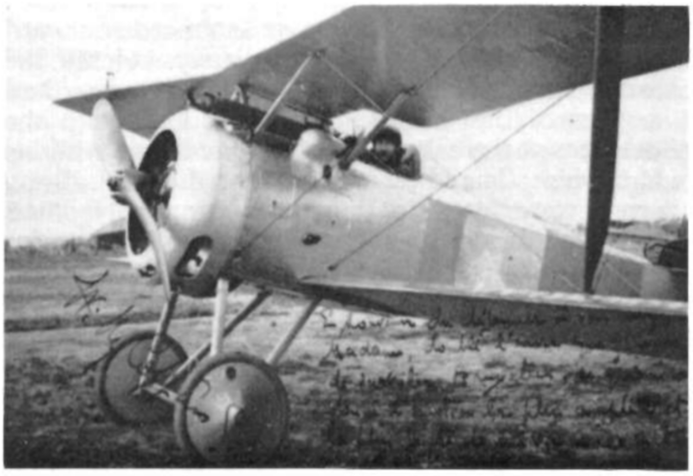
Hanriot HD-1's of an Italian fighter squadron. The marking H·D in the white stripe of the nearest aircraft's rudder suggests that it was an Hanriot-built HD-1.
(Photo: Peter M. Bowers)

Although the first prize was ultimately awarded to S. F. Cody's elephantine and militarily useless biplane, the real winner of the contest was Bielovucic's Hanriot.

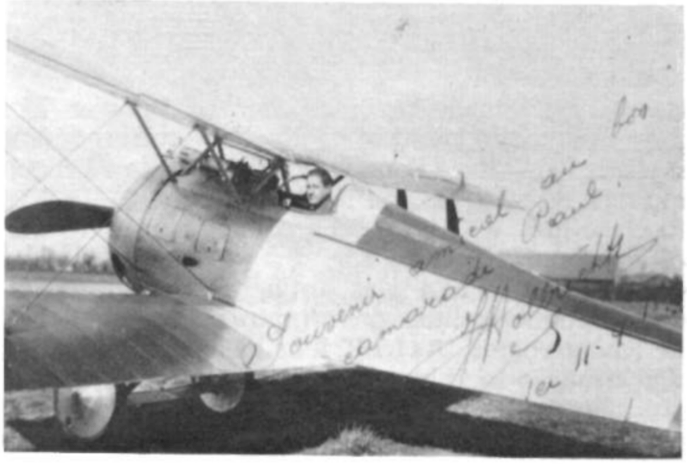
René Hanriot withdrew from aviation in 1913. The line of designs initiated by Pagny was sustained by A. Ponnier, who had been a director of the original Hanriot company. The Ponnier firm's entry in the Gordon-Bennett contest, flown at Reims on 29th September 1913, was a stumpy little monoplane of 23 ft. 6 in. span, powered by a 160-h.p. Gnome rotary engine. This aircraft, flown by Védrines, attained a speed of 197 km./hr. (123 m.p.h.) and came a close second to Maurice Prévost's handsome Deperdussin.

The first Ponnier-Pagny biplane appeared in the early summer of 1913. This aircraft was of metal construction and was reported to be very fast. It was followed by a second biplane type in 1913, and in the following year the Ponnier scout appeared. This was a neat little single-bay biplane powered by a 50-h.p. Gnome engine. Apparently no military use was found for it after the war began.

Late in 1915 the Ponnier company produced a single-seat fighter armed with a single Lewis gun on a central overwing mounting. The design of this aircraft, the Ponnier M.1 (not L.1 as erroneously stated in some places), has been attributed to Pierre Dupont, but it is uncertain whether he was responsible for the entire design. The rudder, tailplane and

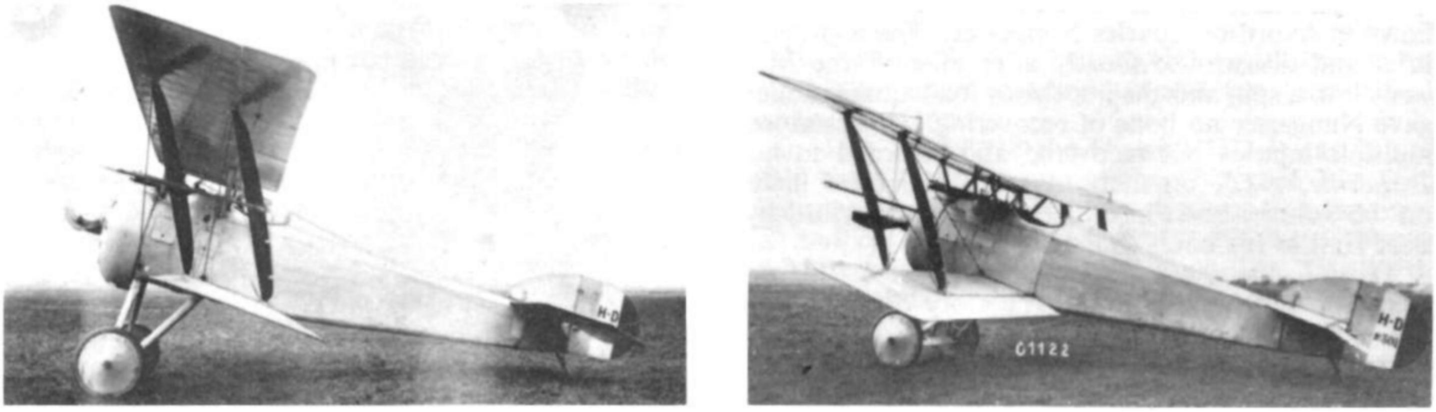


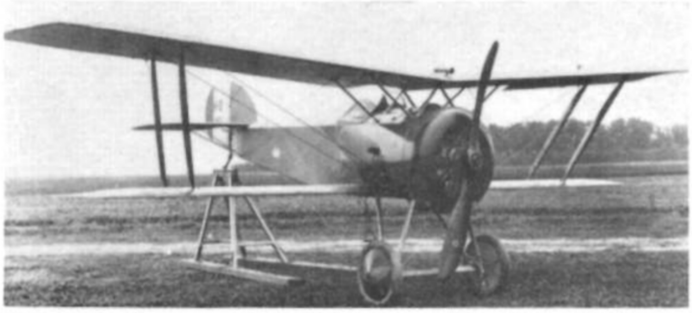
Willy Coppens in a Belgian HD-1.
(Photo: Musée Royal de l'Armée, Brussels)



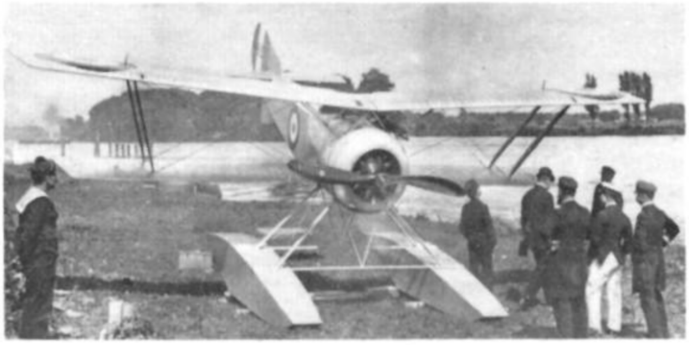
Belgian HD-1 with centrally mounted-gun.
(Photo: Jean Noel)

Hanriot No. 301 with 150 h.p. Gnome Monosoupape, partly faired fuselage sides and modified fin and rudder.
(Photos: Imperial War Museum Q66327 and Q66633)

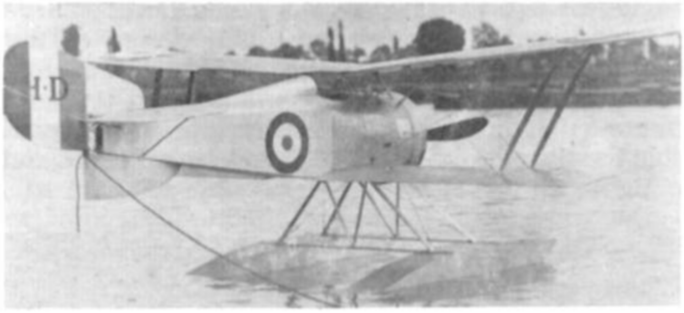




HD-1 No. 61 apparently in Belgian camouflage but with 130 h.p. Clerget engine and modified fin and horn-balanced rudder.
(Photo: Imperial War Museum Q66274)



Above and Below: *Prototype HD-2 with 110 h.p. Le Rhône engine, single gun, enlarged rudder and underfin.*
(Photos: Imperial War Museum Q66289 and Fred C. Dickey, Jr.)



elevators originally designed for the Ponnier M.1 were virtually identical with the corresponding surfaces of the Ponnier-Pagny Gordon-Bennett monoplane of 1913; and the basic design of the M.1 fuselage may well have been equally similar to that of its monoplane precursor.

The Ponnier M.1 was an ugly, ill-proportioned and frail-looking little aircraft, powered by an 80 h.p. Le Rhône engine. As built, it had a modified tailplane that brought the hinge line of the elevators further aft than on the original design. Nevertheless, it retained the peculiar widely-separated elevators that had been a characteristic feature of the Pagny-designed 1913 Gordon-Bennett racing Ponnier monoplane. Span of the M.1 was only 6·18 m. (20 ft. 3¼ in.) its loaded weight 465 kg. (1,023 lb.); its tail unit looked, and indeed proved to be, dangerously small.

On 29th January 1916 a Ponnier M.1 was test flown at Avord by Charles Nungesser. The flight was brief and disastrous: shortly after take-off the M.1 went into a spin and the hopelessly inadequate rudder gave Nungesser no hope of recovering. He sustained multiple injuries but recovered and returned to his *Escadrille*, N.65, on 29th March. His brief flight on the Ponnier must have been the one described by Bert Hall in his book *One Man's War:*

> "Then came the little Ponnier airplane with an 80 h.p. le Rhône engine. The story of that flight can be told very briefly. The little plane went up about 200 metres, did a short turn of the field, tipped over on its nose, and took a dive at the ground. There wasn't enough left of the remains to make a good bonfire."

French official interest in the Ponnier M.1 ended after the crash at Avord, but Belgium, in urgent need of fighting aircraft and unable to obtain all the Nieuports that her *Aviation Militaire* wanted, ordered thirty Ponniers to make good the shortfall. In his book *Days on the Wing* Willy Coppens attributed the decision to order the Ponniers to Major Louis Tournay who, in 1916, was responsible for purchasing all material required by the *Aviation Militaire*.

The Ponniers delivered to Belgium later had a long low-aspect-ratio fin added to the tail unit, and an enlarged constant-chord tailplane was fitted. Even when modified in this way the Ponniers proved to be operationally useless and were withdrawn after only two weeks service.

René Hanriot re-entered the aircraft industry during the war and opened a factory at Billancourt. His new company was one of the major contractors for the licence construction of the Sopwith 1½-Strutter in France. Pierre Dupont joined Hanriot as a designer and in the summer of 1916 the first Dupont-designed Hanriot aircraft appeared.

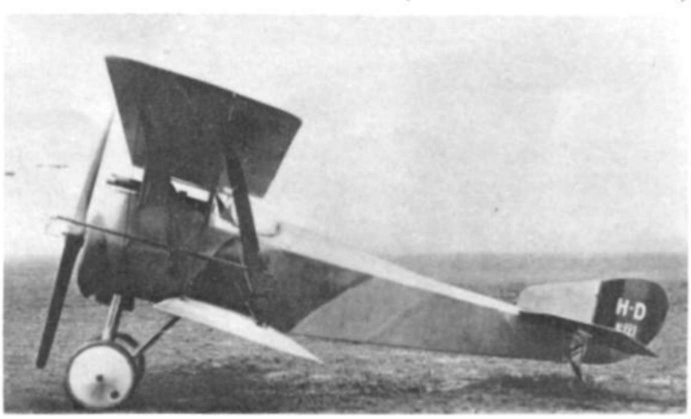
Designated HD-1, the new Hanriot was a single-seat fighter powered by a 110 h.p. Le Rhône 9J rotary engine. It had simple lines and the same compact aesthetic appeal that characterized the Sopwith Pup and Bristol Scout. Sopwith influence was in fact quite strong in the design of the HD-1. Externally the only visible evidence of this lay in the W-configuration of the cabane structure that supported the upper wings: this was identical with the strut arrangement that gave the 1½-Strutter its name.

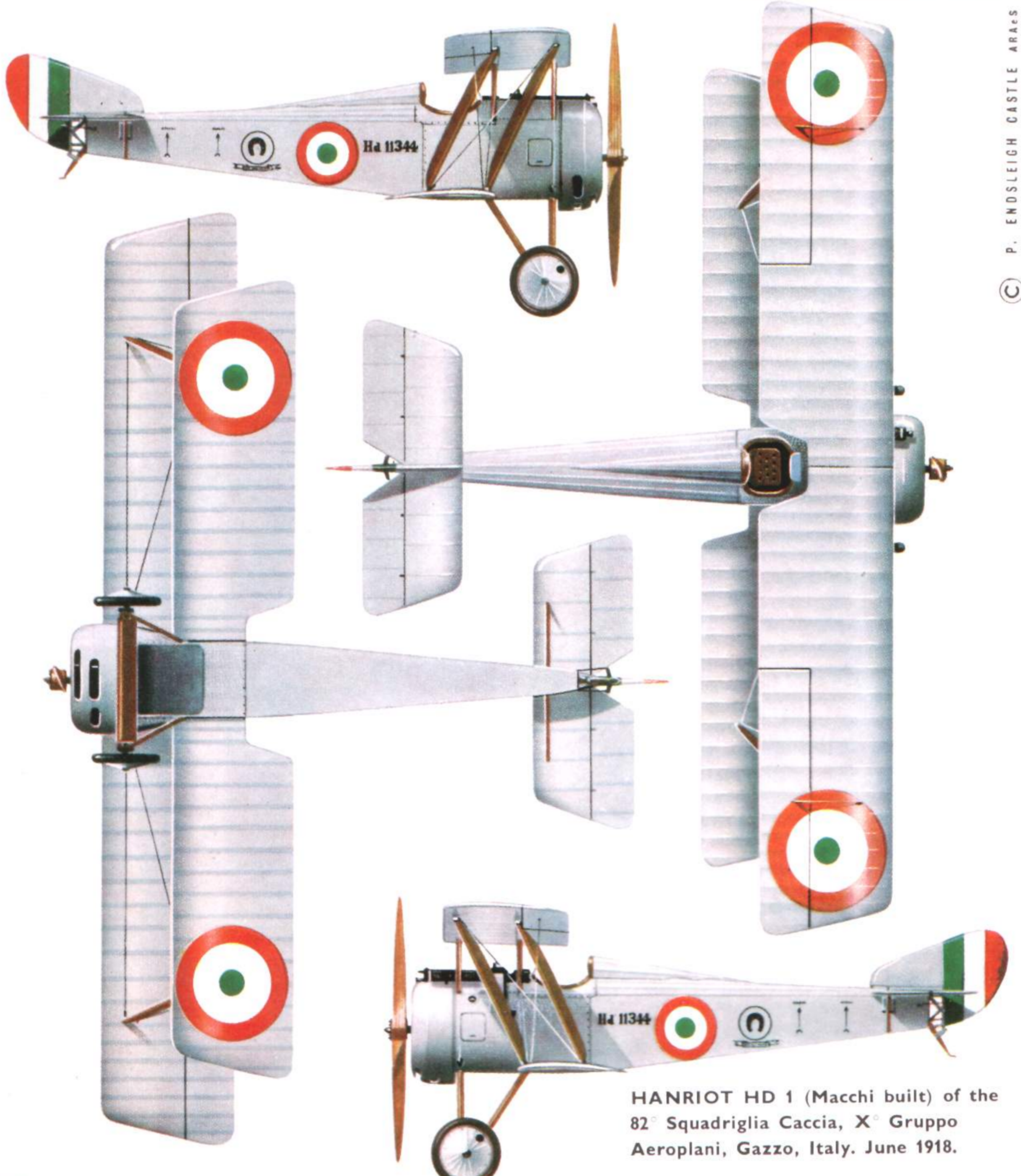
The Hanriot HD-1 was a single-bay biplane with heavily staggered wings of unequal span and chord; the interplane struts had a pronounced outward rake. The cockpit was immediately behind the cabane structure; because the upper wing had 4 degrees of dihedral it was almost level with the pilot's eyes at the cabane and interfered little with his field of view. The lower wing had no dihedral. Long ailerons were fitted to the upper wing only; their control cables ran internally within the lower wing, just behind its front spar, and were led over pulleys up to the ailerons.

The structure was almost entirely conventional but much of its detail reflected contemporary Sopwith practice; this was particularly apparent in the construction of the engine mounting and the tail unit. The latter was made almost wholly of steel tubing; only the ribs and main spar of the tail plane were of wood.

Behind the cockpit was a long head fairing. This was an integral part of the rear top decking and

HD-1 No. 121 for the Aviation Militaire Belge.
(Photo: Peter M. Bowers)

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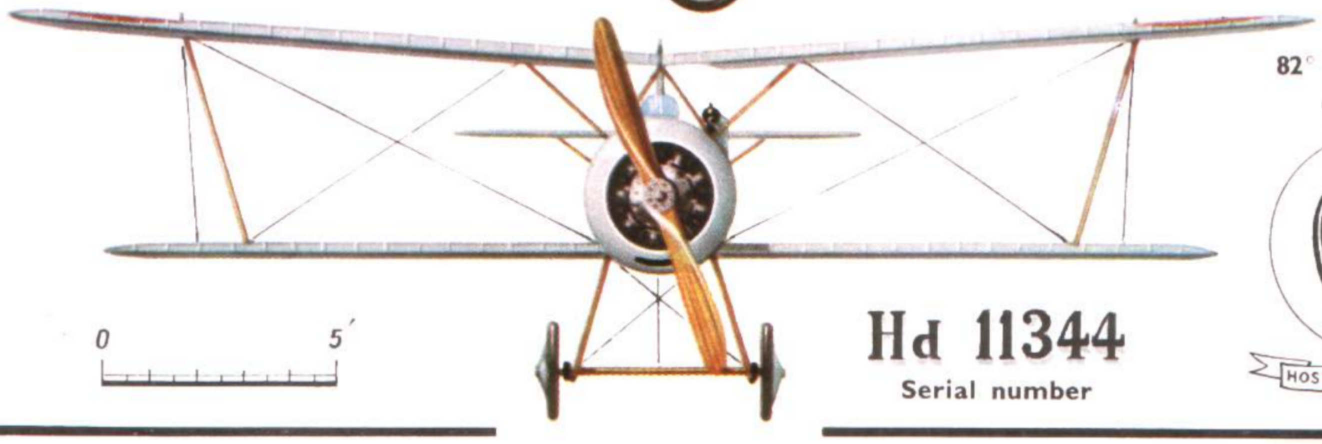
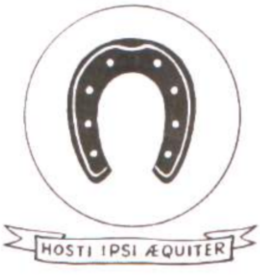
HANRIOT HD 1 (Macchi built) of the 82° Squadriglia Caccia, X° Gruppo Aeroplani, Gazzo, Italy. June 1918.



82° Squadriglia emblem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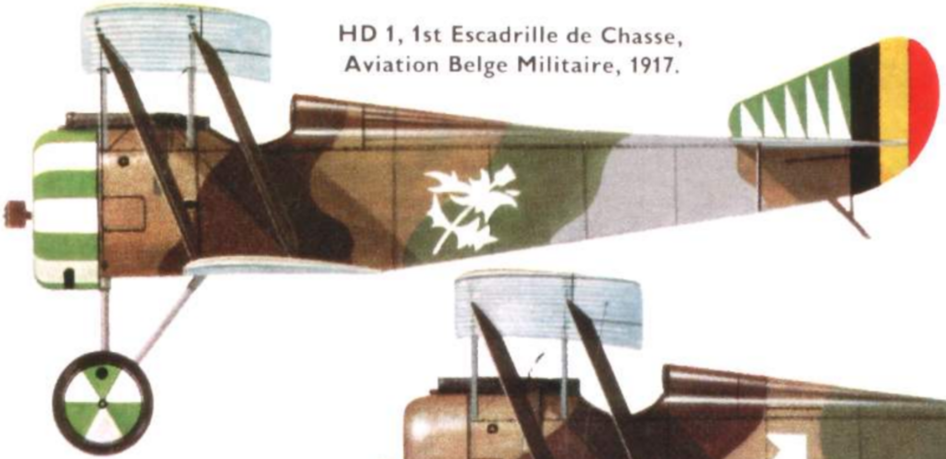
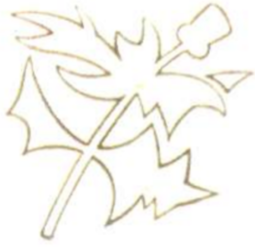
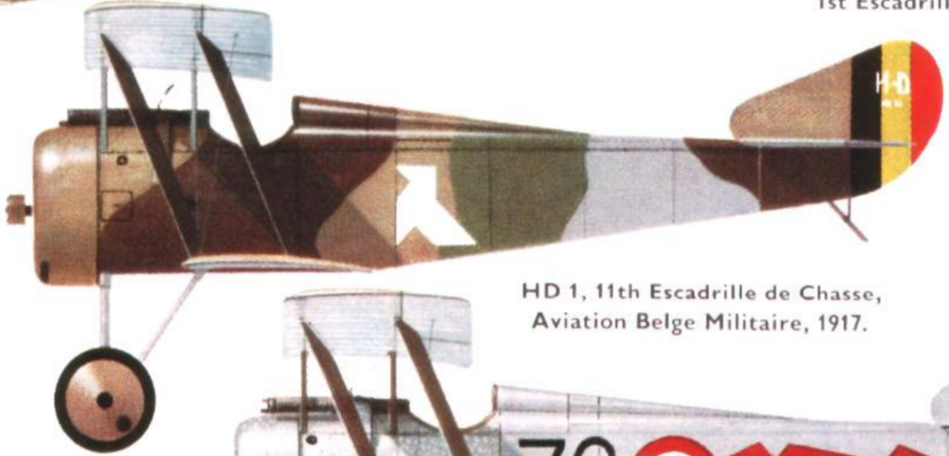


HD 1, 1st Escadrille de Chasse, Aviation Belge Militaire, 1917.



1st Escadrille de Chasse.



HD 1, 11th Escadrille de Chasse, Aviation Belge Militaire, 1917.

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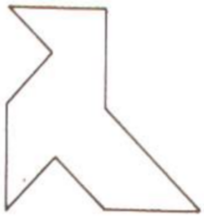
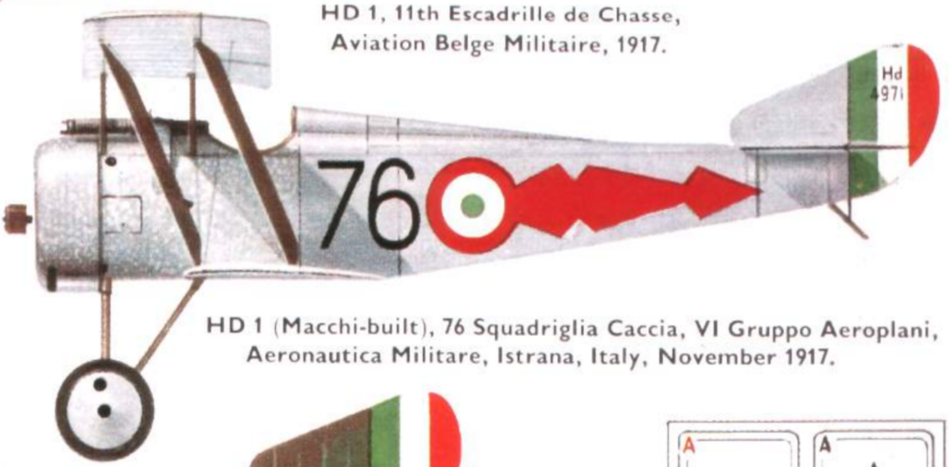
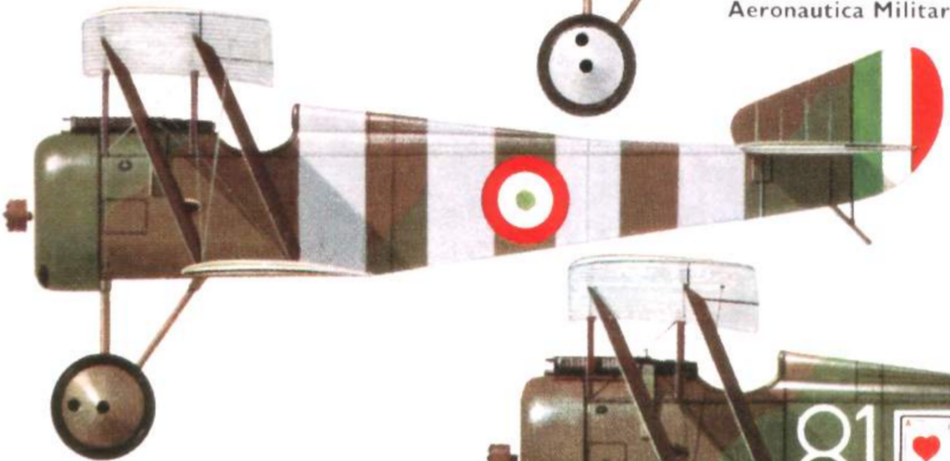


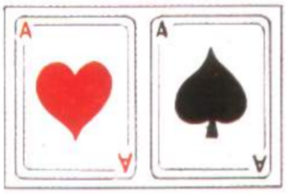
11th Escadrille de Chasse.



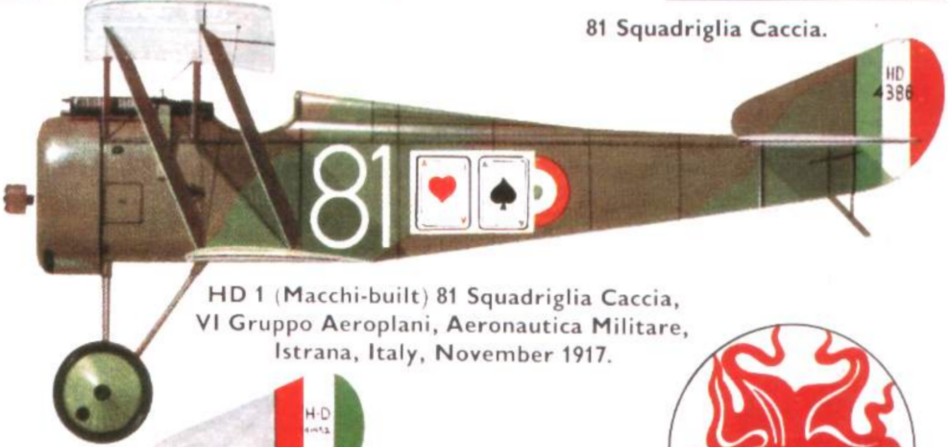
HD 1 (Macchi-built), 76 Squadriglia Caccia, VI Gruppo Aeroplani, Aeronautica Militare, Istrana, Italy, November 1917.



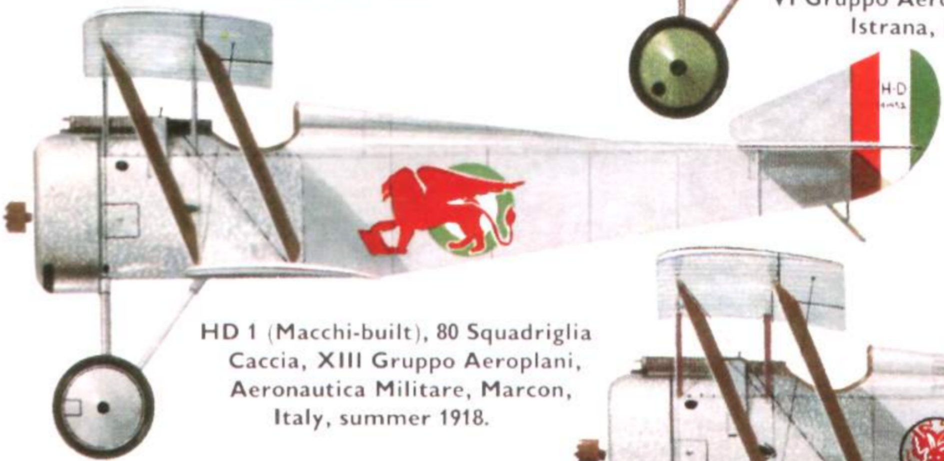
HD 1 (Macchi-built), 81 Squadriglia Caccia, VI Gruppo Aeroplani, Aeronautica Militare, Istrana, Italy, November 1917.



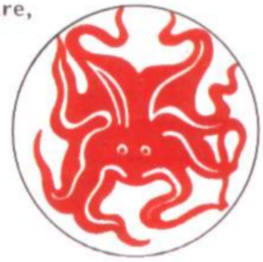
81 Squadriglia Caccia.



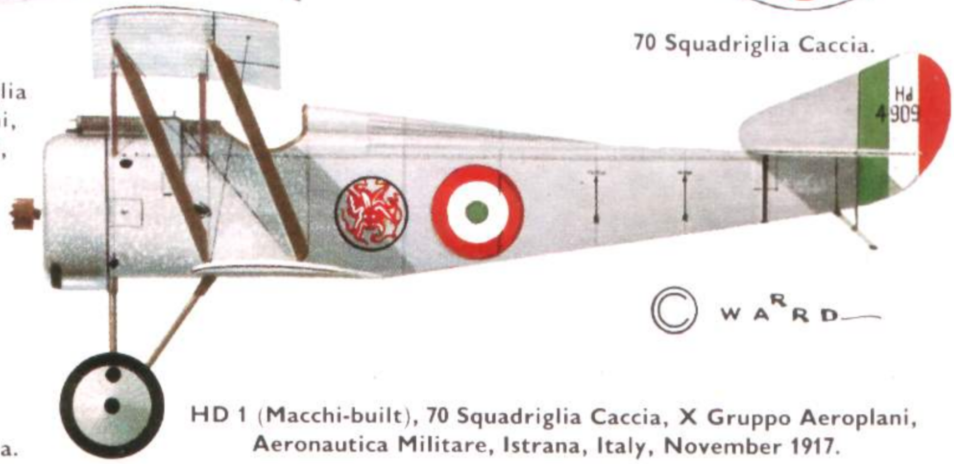
HD 1 (Macchi-built) 81 Squadriglia Caccia, VI Gruppo Aeroplani, Aeronautica Militare, Istrana, Italy, November 1917.



HD 1 (Macchi-built), 80 Squadriglia Caccia, XIII Gruppo Aeroplani, Aeronautica Militare, Marcon, Italy, summer 1918.



70 Squadriglia Caccia.



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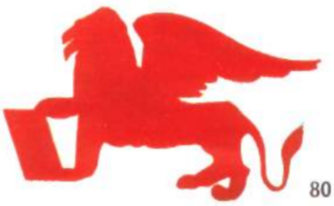
HD 1 (Macchi-built), 70 Squadriglia Caccia, X Gruppo Aeroplani, Aeronautica Militare, Istrana, Italy, November 1917.



80 Squadriglia Caccia.

housed one of the two main fuel tanks, immediately behind the pilot's head. The elevator controls were wholly enclosed. A single control lever was welded centrally to the underside of the steel-tube spar of the elevators; it projected downwards into the fuselage ahead of the sternpost and was linked to a rocker bar pivoted on a shaft that lay athwartships between the two rear vertical spacers. This rocker bar was connected by cables to the pilot's control column.

A single, fixed Vickers gun, mounted above the port upper longeron, constituted the standard armament of the HD-1.

The Hanriot had quite a good performance and was exceptionally manoeuvrable and light on the controls. Unfortunately for its prospects with the French it appeared at about the same time as the Spad VII, which was considered to be so promising that it was ordered in thousands. Beside the Spad the Hanriot, which had the same engine as the Nieuport single-seaters then in service, was regarded as outmoded. As leading French pilots were enthusiastic about the Spad the Hanriot had no chance of being officially adopted for the French military aviation service.

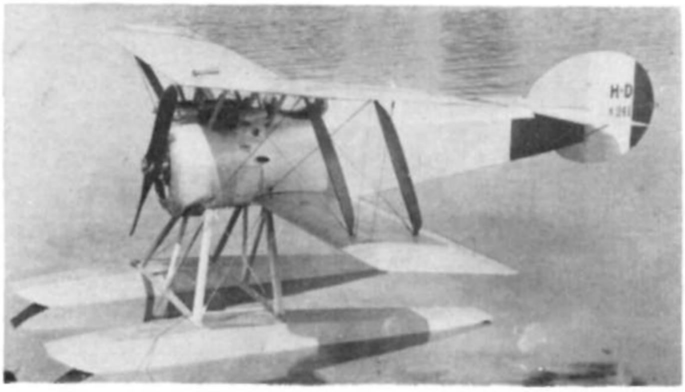
The Italian Military Mission in Paris were interested in the Hanriot HD-1, seeing in it a suitable successor to the Nieuport single-seaters then equipping most of the Italian *squadriglie da caccia.* After thorough evaluation by Italian pilots the HD-1 was officially adopted late in 1916 for the Italian squadrons. Arrangements were made for production of the HD-1 under licence by the Nieuport-Macchi firm. This was a sensible choice, for Nieuport-Macchi had acquired a thorough knowledge of French design and production methods.

Production of the HD-1 began at Varese in November 1916; it seems that the initial order was for 100 Macchi-built aircraft. The first production machines were delivered to fighter-training units, and the HD-1 became operational with Italian units in the summer of 1917. It was reported to be in service with the *76ª Squadriglia* in mid-August. At that time the unit had mixed equipment comprising Nieuports, Spads VII and Hanriots, and was located at Borgnano. Another early HD-1 unit was the *79ª Squadriglia.*

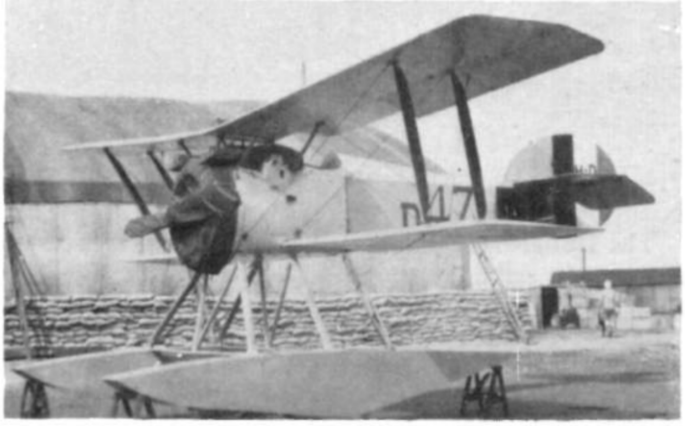
The HD-1 won the instant approval of the Italian pilots, who regarded it as a sturdy aircraft of exceptional manoeuvrability. Its performance was little different from that of the Nieuport 17 (the two aircraft were, of course, usually fitted with the same type of engine), but the Italian pilots preferred the Hanriot's remarkable tractability and its excellent climbing performance. In operational use it was found that the offset gun was not satisfactory; moreover the gun sights were mounted on the cabane struts, an arrangement that was not conducive to accurate sighting. The gun was therefore transferred to a central position on top of the fuselage. This sensible modification led to a marked improvement in pilots' gunnery.

Among the pilots who flew the HD-1 were *Tenente* Silvio Scaroni, *Tenente* Mario Fucini and *Tenente* Giorgio Michetti. Scaroni, with 26 victories the highest-scoring Italian fighter pilot to survive the war, recalls in his memoirs that, cut off and fighting single-handed against several faster Austro-Hungarian aircraft, he lived to fight another day thanks to the exceptional manoeuvrability of his *generoso* Hanriot.

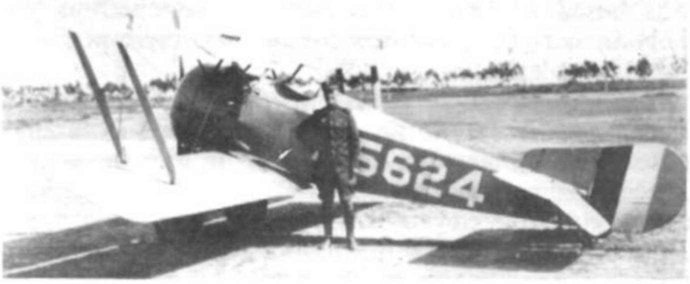
Scaroni was, in fact, possibly the most brilliant exponent of the Hanriot HD-1 as a fighting aircraft. His victories included a Gotha, shot down on 26th December 1917; in that same combat Scaroni shot down two Knoller C.II two-seaters. On 7th July 1918, while on patrol with Sergente R. Ticconi, Scaroni sighted a mixed formation of Phönix and Brandenburg single-seat fighters over Asiago. The two Hanriots attacked; in the ensuing combat Scaroni shot down two Brandenburgs and a Phönix, Ticconi two Phönix scouts.



Later HD-2, No. 241, with twin guns, modified fin and rudder and Badin fuel system.
(Photo: Imperial War Museum Q66288)



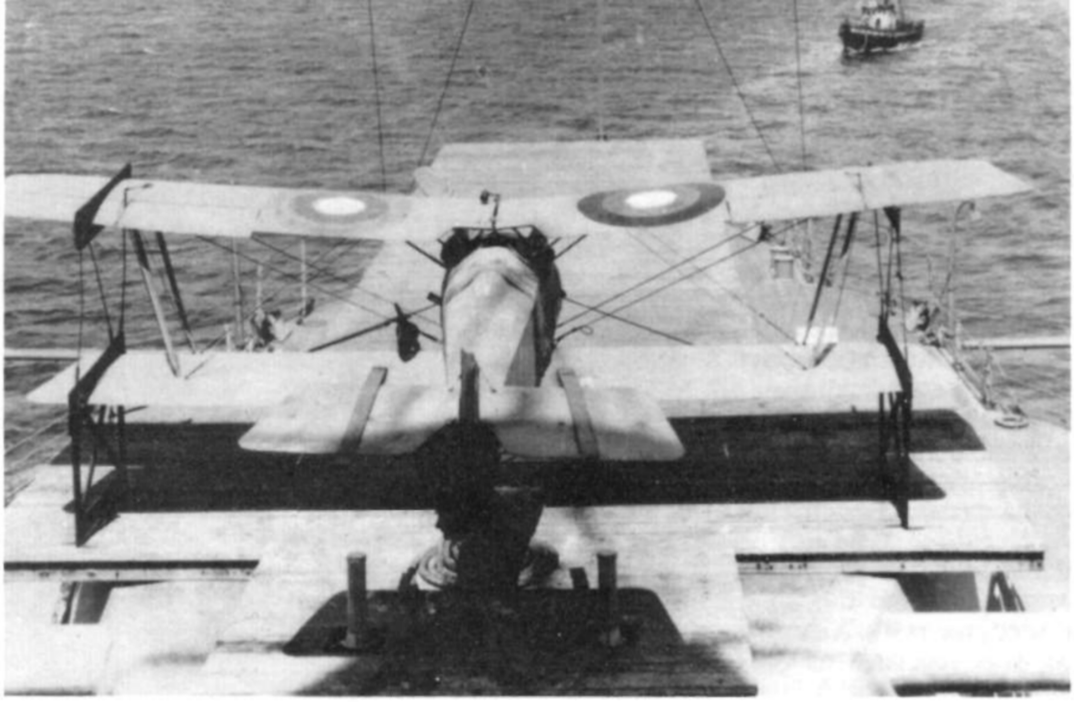
U.S. Navy HD-2 with late-type fin and rudder at Dunkerque, 1918. (Photo: Fred C. Dickey, Jr.)



U.S. Navy HD-2 convert A5624 *at North Island, late summer 1919. Note retention of early HD-2 enlarged rudder and generator mounted on lower port wing root.*
(Photo: Fred C. Dickey, Jr.)

At one time Scaroni had an HD-1 with twin guns, but this armament installation was never standardized for Italian Hanriots.

By 15th June 1918 the Hanriot HD-1 was in use with the following *squadriglie:* 70ª and 82ª (14° Gruppo) at Gazzo, 71ª (16° Gruppo) at Sovizzo, 78ª and 79ª (15° Gruppo) at Paese, 80ª (13° Gruppo) at Marcon, 76ª and 81ª (6° Gruppo) at Casoni di Bassano, and the 83ª (7° Gruppo) at San Pietro in Gù. In some cases the Hanriot was not the only type flown by the unit: even at mid-1918 several Italian fighter squadrons had mixed equipment; e.g. the



A5624 *on flight platform aboard U.S.S.* Mississippi, *August 1919.*
(Photo: Fred C. Dickey, Jr.)

71ª (Spad and HD-1) 79ª, 81ª and 83ª (HD-1 and Nieuport).

The Italian *Aeronautica del Regio Esercito* used the Hanriot in Albania and Macedonia. Little has been recorded of the activities of the 85ª *Squadriglia* in Albania, but it is known that Hanriots replaced its Nieuports and that the unit did much valuable escort work with the Farmans of the 34ª *Squadriglia* and the Capronis of the 11ª.

In Macedonia the HD-1 served with the 73ª *Squadriglia*, and a mixed section of Nieuports and Hanriots under the command of *Tenente* Bonavoglia was based at Dudular, apparently attached to the 111ª *Squadriglia*, a two-seater squadron equipped with SAML biplanes.

The true extent of Italian production of the HD-1 is difficult to determine. Several sources state that a total of 1,700 were ordered from the Nieuport-Macchi company and imply that the 831 aircraft actually delivered to the *Aeronautica del Regio Esercito* were built by that company. This may well have been so, but in his book '*L'Aviazione Italiana in guerra*' Capitano L. Contini indicated that some HD-1's had gone to Italy from France; and in *Days on the Wing* Willy Coppens wrote that on 8th September 1918 he "went out to Buc and made a flight in a HD-1 built for the Italian air force".

The little Hanriot was more widely used by Italian squadrons than any other type of fighter aircraft during the 1914-18 war, and the type remained in service for several years after the Armistice. At one period sixteen of the eighteen Italian fighter squadrons had HD-1s. Production continued for a time after the war ended: the Nieuport-Macchi works completed 70 HD-1s in the post-Armistice period. When the *Regia Aeronautica* was created in 1925 the HD-1 was still in service with the 1° *Stormo*.

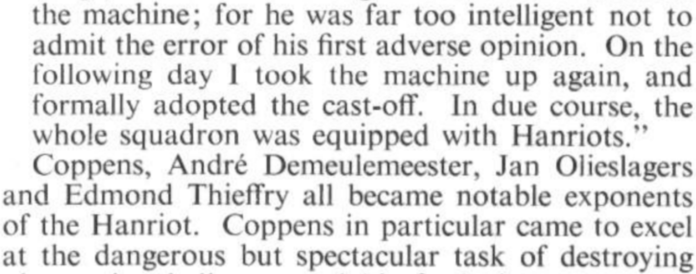
The Belgians used the Hanriot HD-1 on a much smaller scale but theirs were the only aircraft of the type to see operational service on the Western Front. The initial Belgian order for the HD-1 was placed with the Hanriot company in June 1917, and the first aircraft was delivered on 22nd August 1917. The first were allocated to the 1ere *Escadrille* of the *Aviation Militaire* at Les Moëres. The events associated with their arrival at that distinguished unit are described by Willy Coppens (Baron Willy Coppens de Houthulst) in *Days on the Wing:*

"I was present when the first Hanriots came, and on this occasion I can assert that the Squadron very nearly refused them, as I believe it had refused the Spads.

André de Meulemeester had the first and declined to keep it. He therefore handed it over to Olieslagers, who declined to keep that which de Meulemeester had no use for. And so on, and I, being about the last to have joined the squadron, finally had it offered to me. I did not like the Nieuport, whose controls were not light to the touch—and my '13 square metres' was particularly heavy. I fell in love with the Hanriot at first sight. It was as light as a feather on the controls, and the pilot had a wonderfully clear field of vision. Although my first flight in this machine was made in very bad weather, I landed it perfectly, albeit without taking any very great pains, and was delighted with it. Jan Olieslagers, who had watched me come down, congratulated me and began to take an interest in the machine; for he was far too intelligent not to admit the error of his first adverse opinion. On the following day I took the machine up again, and formally adopted the cast-off. In due course, the whole squadron was equipped with Hanriots."

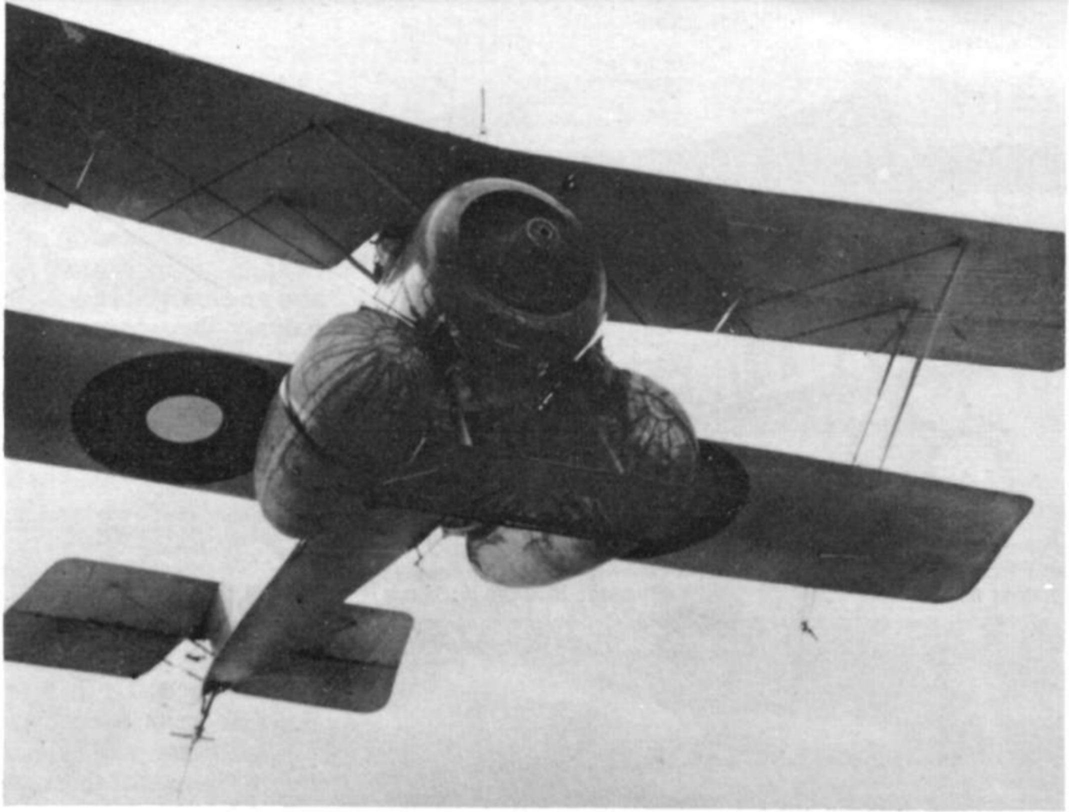
Coppens, André Demeulemeester, Jan Olieslagers and Edmond Thieffry all became notable exponents of the Hanriot. Coppens in particular came to excel at the dangerous but spectacular task of destroying observation balloons, and his final victory score of 37 included no fewer than 26 balloons. The predominance of balloons in his score does not mean that he had few combats with enemy aircraft: on the contrary, his book contains accounts of many fights before his passion for attacking balloons developed. At first, however, Coppens and his colleagues found it difficult to achieve success, owing to gun troubles and inaccurate sights.

The Belgian pilots were naturally anxious to



U.S. Navy HD-2 convert A5625 *at Anacostia.*
(Photo: Peter M. Bowers)

U.S. Navy HD-2 convert with hydrovane, wheels jettisoned and flotation gear inflated. This aircraft had the concentric-ring marking with white centre. (Photo: U.S. Navy)



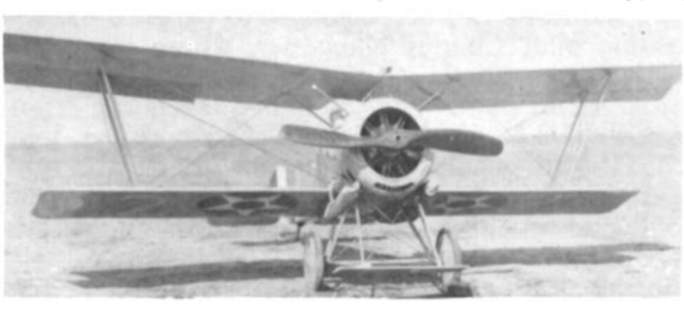
improve the Hanriot's armament. Like Scaroni, André Demeulemeester fitted a second gun to his aircraft but found that the additional weight seriously reduced the Hanriot's climbing performance. His aircraft, which was painted yellow, was sent back to the depot at Calais to have the single Vickers gun re-positioned centrally, just as the Italian pilots had been obliged to do. This position of the Vickers gun was standardized for the Belgian Hanriots.

Coppens tested a twin-gun HD-1 at Calais on 23rd, 24th and 25th October 1917 and found that the aircraft had a service ceiling of 19,600 ft. This compared quite well with contemporary fighters but was not regarded as good enough by Demeulemeester.

In his early attacks on balloons Coppens had found the standard 7.7 mm. calibre Vickers gun less effective than he would have wished. Early in June 1918 Capitaine de Briey of the French Aeronautical Supply Department sent him a "modified Vickers machine-gun of 11 mm. calibre, firing incendiary ammunition of a particularly effective pattern. This weapon, which, was the *second* made to this specification, was marvellous, and twice as useful as that of 7 mm. calibre." Coppens had this gun fitted to his Hanriot No. 17 (which he had flown for the first time on 31st January 1918) and retained No. 24 (which he had acquired on 3rd April 1918) as a standard aircraft. His earlier mounts had been Hanriots Nos. 1 and 9. It is possible that one other Belgian Hanriot was fitted with an 11 mm. Vickers gun.

It seemed to take some time for the R.F.C./R.A.F. to realise that the Hanriot was in service with the Belgian *escadrilles.* Not until 3rd May 1918 was the following memorandum issued by R.A.F. Headquarters:

U.S. Navy HD-2 convert with hydrovane in front of wheels and stowed flotation gear. This aircraft wore the U.S. star insignia and a numeral 2 under each lower wing.
(Photo: Fred C. Dickey, Jr.)



> "Will you please warn all pilots that the Belgians are now using the HANRIOT Scout. It has a rotary engine and is not unlike our Camel but has slight extensions. The top plane has a pronounced dihedral. Its armament is one gun firing through the propellor.
>
> Photographs will be sent to you within the next few days for distribution to squadrons."

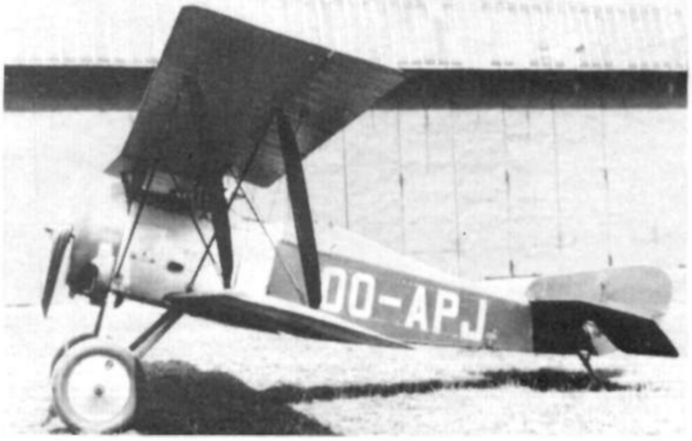
All the Hanriots of the 9me *Escadrille* (as the 1ère had become in February 1918) were either destroyed or damaged by enemy bombing on 13th June, and on the 18th Coppens took over Hanriot No. 6. This was a reconditioned aircraft that had been re-covered and freshly doped. Coppens disliked its camouflage colours and had it painted bright blue.

Coppens also used Hanriot No. 23, which was fitted with a Lanser fireproof fuel tank. This tank was a personal gift to Coppens from René Hanriot, who took a close personal interest in the performance of his company's products. Apparently Coppens had No. 23 painted blue also. On 16th September 1918 he was allotted No. 45 as a second aircraft. It therefore seems probable that he was flying No. 23 on 14th October 1918 when he was brought down, seriously wounded, after destroying the Praet-Bosch balloon.

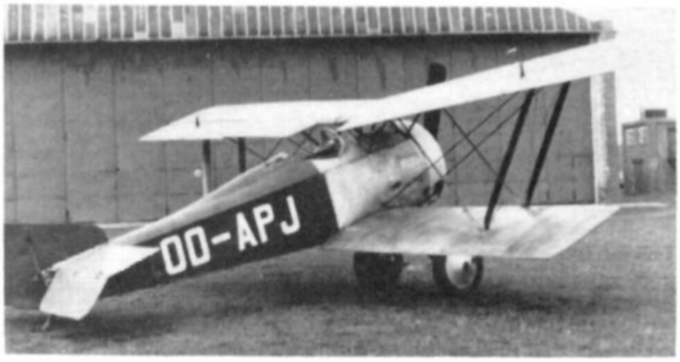
An interesting indication of the Belgian pilots' opinion of the Hanriot is provided by the fact that, when offered Sopwith Camels early in 1918, the 1ere *Escadrille* preferred to keep its HD-1's and the Camels were passed on to the 11me *Escadrille*—which itself later had some HD-1's also. Despite the Camel's twin guns the Belgians preferred the Hanriot's better-balanced responsiveness and the superior view from its cockpit.

The Hanriot HD-1 remained in use in Belgium's air service for several years after the war. The IV Fighter Group at Schaffen used the type, and some were on the strength of the 7me *Escadrille de Chasse* at Nivelles in 1926.

Several modifications of the design appeared in 1917 and 1918. No. 61 was fitted with a 130-h.p. Clerget engine and had a modified fin and horn-balanced rudder similar in profile to the vertical tail



Formerly No. 75 of l'Aviation Militaire Belge, 00-APJ had oversize tyres and a modified head fairing when these photographs were made. (Photos: Marvin K. Hand)



surfaces of the Hanriot HD-3C.2. A venturi tube mounted on the upper wing suggested that a Badin-type fuel system was fitted.

An Hanriot HD-1 with a 170-h.p. Le Rhône engine was built in 1918. This aircraft was to have been allocated to Willy Coppens, and he went to Paris on 8th September to collect it. Unfortunately the engine, which differed substantially from the 110-130-h.p. Le Rhône that Coppens knew so well, was temperamental and he never flew the aircraft. He returned to his squadron on 14th September. Apparently the engine was persuaded to run well enough for some flights to be made, for an official document records a speed of 200 km./hr. (125 m.p.h.) for this variant.

Another high-powered version of the Hanriot HD-1 had the 150-h.p. Gnome Monosoupape. This installation was made in No. 301, and the aircraft had other modifications. Whereas the side fairings of the engine cowling ran only to the rear of the cockpit on the standard HD-1, on No. 301 formers and stringers provided a longer and more gradual transition from the circular cross-section of the engine to the flat sides of the rear fuselage. A redesigned fin and rudder were fitted: the fin had a distinctly "Sopwith" profile, and the low-aspect-ratio rudder was not well matched with it. The engine cowling had a number of circular holes round the main frontal opening.

The Hanriot was not entirely without honour in its native country, for some were used by French naval aviation units. Some of these were flown from small shipboard platforms mounted on ships' gun-turrets in the same manner as British Pups, Camels and 1½-Strutters. The first successful take-off of this kind by a French HD-1 was made in 1918 by Lieutenant de Vaisseau Georges Guierre flying from a platform on board the battleship *Paris* at sea off Toulon. At least one aircraft used in this way had a fin and rudder like those of No. 61 and also had a venturi tube above the upper wing.

At least one of the HD-1's of the French naval air station at Dunkerque was fitted with flotation gear that was very similar to the inflatable air-bags developed at the R.N.A.S. experimental station at the Isle of Grain. This aircraft also had twin Vickers guns.

A seaplane version of the Hanriot, designated HD-2 existed. The prototype had the standard HD-1 fin and an enlarged rudder supplemented by an underfin to balance the side area of the floats; it also had a single gun, offset to port as on the HD-1. The first production HD-2's had the same enlarged rudder as the prototype, but later aircraft, as exemplified by No. 241, had a completely revised vertical tail assembly incorporating a fin of the type fitted to No. 61. Twin Vickers guns were installed, and the venturi tube appeared on the upper wing. The HD-2 was remarkable for its lack of a tail float: the long, single-step floats kept the aircraft in a tail-high attitude.

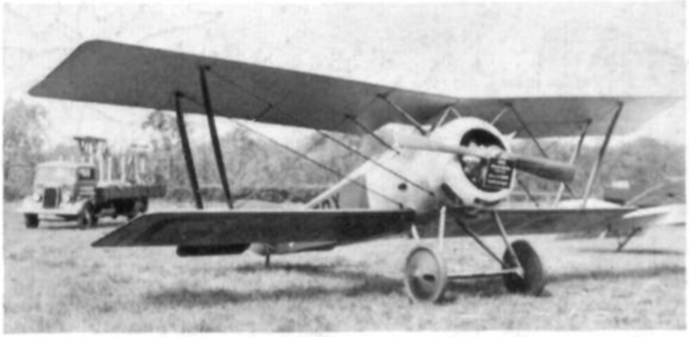
The United States Navy operated a few coastal air stations in France in the late stages of the war. This brought them into contact with French naval aviation units operating Hanriot HD-2's and led to an American purchase of ten aircraft. It is recorded in one document that these were acquired as seaplanes but were sent to the U.S. Naval Aircraft Factory at League Island, Philadelphia, for conversion to landplanes. (It was for long believed that they had been built at the N.A.F.). These Hanriots were allotted the U.S. Navy designating numbers *A5620—A5629* and were fitted with Clerget engines. They were armed with twin Vickers guns.

The U.S. Navy's HD-2 converts were used for training in combat flying, and at least one, *A5624*, was flown from a gun-turret platform on U.S.S. *Mississippi* in 1919. This aircraft had a large wind-driven generator mounted on the port lower wing, suggesting that it may have had an early radio-telephony installation. Four other HD-2 converts were used by the second Ship Plane Unit that began its training activities at Langley Field on 28th May 1919. This unit was disbanded in the following August.

The Hanriots survived at least these early U.S. Navy activities for, in the report of the Navy Department of aircraft on hand on 1st November 1919, all ten Hanriots were listed. It is of interest, in view of their origin, to note that they were even at that date recorded as "Hanriot seaplanes".

In 1921 sixteen Hanriot HD-1's were purchased by Switzerland for the use of the Swiss *Fliegertruppe*. These were given the Swiss serial numbers *651-666* and were flown from Dübendorf.

At least five specimens of the Hanriot HD-1 survive at the time of writing. Belgian HD-1 No. 78 hangs in Brussels' *Musée Royal de l'Armée et d'Histoire militaire*, its deplorable condition a sad memorial to such men as Coppens, Demeulemeester and Olieslagers. A Macchi-built HD-1 is displayed in the Museo del Volo in Turin; and No. *653* of the Swiss *Fliegertruppe* is preserved at Dübendorf. In Ed Maloney's air museum at Claremont, California, is an Hanriot HD-1 that belonged to the great French fighting pilot Charles Nungesser, whose disastrous early acquaintance with the Ponnier M.1 is related on an earlier page. Nungesser had taken this HD-1 to the U.S.A. in 1924 for a barnstorming tour (contrary to popular belief he did not fly the type operationally during the war). He flew it bearing the coffin-and-candles insignia that had distinguished his Nieuport during the war years. The aircraft was sold after his death and appeared in the films *Wings* and



By the time OO-APJ had become G-AFDX of the Shuttleworth Trust it had been fitted with a pair of more suitable wheels and tyres. (Photo: W. K. Kilsby)

Hell's Angels, at which time it had a 100-h.p. Gnome Monosoupape engine. It was restored by Ed Maloney in 1951-2.

The fifth survivor of the type was the only HD-1 to bear a British civil registration. Originally No. 75 of the Belgian *Aviation Militaire*, this aircraft bore the Belgian registration OO-APJ from 1934 until it was bought by the Shuttleworth Trust in 1938, when it became G-AFDX. It was seriously damaged in 1939, and its wings were destroyed by enemy bombing in 1940. It is still hoped to rebuild this aircraft.

© J. M. Bruce, 1966. The author acknowledges gratefully the contribution of Jean Noël to this history.

PRODUCTION

The Hanriot HD-1 was produced by the Société Anonyme des Appareils d'Aviation Hanriot, Avenue des Moulineaux, Billancourt, Seine, France, and by the Società Nieuport Macchi, Varese, Italy. It is difficult to determine how many HD-1's were built, and by whom; but it seems reasonably certain that 125 Hanriot-built aircraft were supplied to Belgium and that 831 HD-1's were delivered to Italian *Squadriglie da caccia* before the Armistice. It is probable that some at least of the Italian Hanriots were built in France by the parent company. Seventy were built by Macchi after the Armistice.

SPECIFICATION

Power: 110 h.p. Le Rhône 9J, 120 h.p. Le Rhône 9Jb, 130 h.p. Le Rhône 9Jby, 130 h.p. Clerget 9B, 150 h.p. Gnome Monosoupape, 170 h.p. Le Rhône 9R.
Dimensions: A remarkable variety of dimensions for the HD-1 have been published within recent years; for example, the span has been variously reported as 8·5 m., 8·51 m., 8·52 m. and 8·7 m. The figures that follow are those that are most consistent with reconcilable documents contemporary with the aircraft.
Span, upper 28 ft. 6·4 in., lower 24 ft. 3¼ in.; length 19 ft. 1⅞ in.; height 8 ft. 4⅜ in. (U.S. Navy document gives 9 ft. 8 in. for U.S.N. converted HD-2 landplane); chord, upper 4 ft. 1·2 in., lower 3 ft. 9¼ in.; gap, minimum 3 ft. 6 in., maximum 4 ft.; stagger 2 ft. 1 in.; dihedral, upper 4 deg., lower nil; incidence 2 deg., washing in at port interplane struts to 2 deg. 15 min.; wheel track 4 ft. 11⅞ in.
Areas: Wings (including ailerons) 194·5 sq. ft.; ailerons, each 11·2 sq. ft., total 22·4 sq. ft.; tailplane 16·4 sq. ft.; elevators 12·8 sq. ft.; fin 2·9 sq. ft.; rudder 7·9 sq. ft.
Armament: One fixed 0·303 in. Vickers machine-gun; a few aircraft had two Vickers guns. Willy Coppens had a Vickers gun, said to be of 11 mm. calibre, fitted to his HD-1 No. 17.

SERVICE USE

Italian: The HD-1 is known to have equipped, in whole or in part, the 70a, 71a, 72a, 73a, 74a, 75a, 76a, 78a, 79a, 80a, 81a, 82a, 83a, 85a and 91a *Squadriglie* of the *Aeronautica del Regio Esercito*. Of these units, the 73a *Squadriglia* operated in Macedonia, the 85a in Albania. A flight of Hanriots was attached to the 111a *Squadriglia* at Dudular in Macedonia. The type was used for training purposes at Foubera.

The Hanriot remained in Italian service in the post-war years. Some were in service with the 1° *Stormo* in 1925.

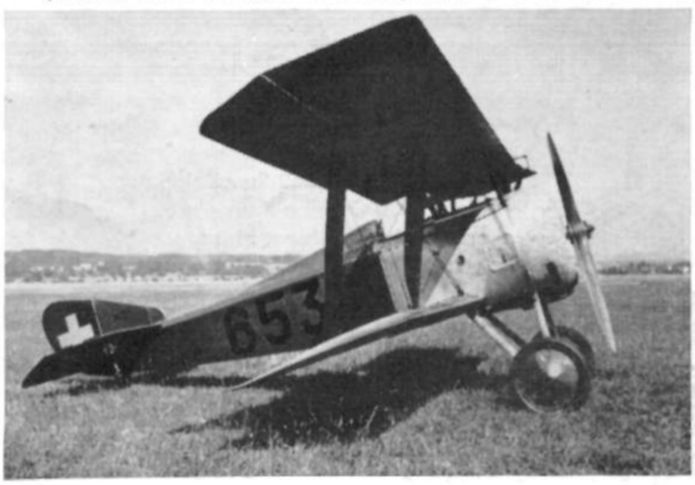
Belgian: 1ere (later 9me) *Escadrille de l'Aviation Militaire*: apparently some Hanriots were used by the 11me *Escadrille*. In post-war Belgian service the HD-1 was used by the IV Fighter Group at Schaffen and by the 7me *Escadrille de Chasse*.
French: Used in small numbers by French naval units from coastal stations, e.g. Dunkerque. Also flown from battleships, e.g., *Paris* and possibly *Bapaume*.
U.S. Navy: A few HD-1's and HD-2's reported to have been operated from coastal stations in France in 1918; ten HD-2's bought by the U.S.N. and sent back to the U.S.A. for conversion to landplanes. The ten converted HD-2's were used as HD-1's in 1919; at least one (*A5624*) on U.S.S. *Mississippi*: others flown by Ship Plane Unit at Langley Field.
Swiss: Sixteen HD-1's used by Swiss *Fliegertruppe* at Dübendorf.

WEIGHTS AND PERFORMANCE

As with the dimensions of the HD-1, so do published performance figures vary considerably. The origins of the figures in the second, third and fourth columns of the following table have not been discovered; and the performance attributed to the U.S. Navy aircraft, despite its appearance in an official document, is too optimistic to be acceptable.

Source	Section technique de l'Aeronautique	—	German report	Italian sources	U.S. Navy Dept. report of 25.6.19	Ministry of Munitions (Dept. of aircraft production) table	
Engine	120-h.p. Le Rhône 9Jb	Believed 120-h.p. Le Rhône 9Jb		120-h.p. Le Rhone 9Jb	130-h.p. Clerget	150-h.p. Monosoupape	170-h.p. Le Rhône
Weights (lb.):							
Empty	908	882	904	849	1,021	—	—
Military load	—	—	—	—	185	—	88
Pilot	—	—	—	—	165	—	—
Fuel and oil	—	—	—	—	234	—	—
Loaded	1,360	1,334	1,322	1,268	1,605	1,268	1,268
Max. speed (m.p.h.) at:							
Ground level	—	114	108·5	110·6	113	—	—
3,280 ft.	—	—	—	—	—	—	—
6,560 ft.	—	110·5	—	96·3	—	—	—
9,840 ft.	—	—	—	—	—	—	—
13,120 ft.	—	—	—	—	—	115	125
Climb to:	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.
3,280 ft.	— —	2 58	3 0	2 40	— —	— —	— —
6,560 ft.	5 31	6 3	6 0	6 40	— —	— —	— —
9,840 ft.	9 17	11 3	11 0	11 10	8 30	— —	— —
13,120 ft.	14 8	19 30	17 0	16 30	— —	13 10	— —
16,400 ft.	21 30	32 0	— —	— —	— —	— —	— —
Ceiling (ft.)	20,500	20,670	—	22,960	—	—	—
Endurance (hours)	—	2½	—	3	2·4	2	2

No. 653 of the Swiss Fliegertruppe, *currently preserved at Dübendorf.*
(Photo: Swiss Institute of Transport and Communication)



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